

## The Effects of using Chemical Fertilizers along with Guillard (f/2) on Growth, Biochemical Compositions, Fatty Acid Profiles, Chlorophylls and Total Carotenoids of *Haematococcus pluvialis* in Brackish Water

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### Abstract

**Introduction:** Using the standard methods for the productions of unicellular algae have high harvest costs and in many cases is not affordable. Therefore, chemical fertilizers could be considered as an appropriate alternative for the production of unicellular algae. The green microalgae *Haematococcus pluvialis* is capable of producing high levels of astaxanthin and lipid in resistant cells called spore.

**Materials and methods:** *H. pluvialis* with the initial density of  $4.25 \times 10^4$  cell mL<sup>-1</sup> transferred to the 3-liter containers. Fatty acid profiles, growth factors, chemical compositions and pigments of algae were investigated.

**Results:** The results showed that the specific growth rate, the cell division per day, carbon dioxide fixation efficiency, biomass, and total biomass efficiency were significantly higher and lower in treatment 5 (G: I= 50:50) and 9 (Gf= 100), respectively. The highest protein (40.68%), lipid (34.88%) and carbohydrate (42.04%) contents were observed in treatments of 9, 2 (G: R= 50:50) and 8 (I= 100), respectively. The highest chlorophyll a (71.29 mg/g FW) in T9 and chlorophyll b (85.60 mg/g FW) in T3 (G: R= 75:25) and total carotenoid (206.11 mg/g FW) in T6 (G: R= 75:25). Saturated fatty acid was significantly highest in T6, but its poly unsaturated fatty acid was significantly highest in T2.

**Discussion and conclusion:** The results indicated that the f/2 medium promotes biomass and lipid in T9 and T5, T6 made increase total carotene and SFA and T2 and T4 raised Mono saturated fatty acid and PUFA in *H. pluvialis* when it is cultured in brackish water.

**Key words:** *Haematococcus pluvialis*, Biochemical Composition, Fatty Acids, Chlorophyll, Total Carotenoid

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